Dynamics of Political and Social Change

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ARO MURI: Evolution of Cultural Norms and Dynamics of Socio-Political Change

Daron Acemoglu

MIT

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Introduction: Theoretical Achievements

- Conceptualizing and modeling political and social change:
  - What are the main drivers of political and social change? When do beneficial changes get blocked? How do changes spillover across micro units and aggregate to the micro level? How do turbulences and revolution’s impact economic outcomes?

- Theoretical Framework:
Empirical Achievements

- Acemoglu, Garcia-Jimeno and Robinson (2013) “State Capacity and Economic Development: A Network Approach.” Focus on the building of state capacity at the micro (municipality-level) in Colombia, modeled as a network, in which each unit makes endogenous choices, creating spillovers on others. Estimate the model (related to Blume’s work on identification).


- Acemoglu, Hassan and Tahoun (2014) “Street Protests and Rent-Seeking Networks: Evidence from Egypt’s Arab Spring”. The impact of street protests on existing rent-seeking networks and the emergence of new ones.
State Capacity

- An important dimension of institutions is the capacity of the state to collect taxes, regulate economic activity, enforce laws, etc.
- In Joel Migdal’s words in *Strong Societies and Weak States*:
  
  "In parts of the Third World, the inability of state leaders to achieve predominance in large areas of their countries has been striking..."
Income and Taxes

Figure 1
Tax Revenue and Income 1990-2000

- Tax Revenue as % of GDP (WDI)
- Log GDP per Capita (Penn World Tables)

Countries represented in the scatter plot include:
- ALB
- ARG
- AUS
- AUT
- BDI
- BEL
- BFA
- BGD
- BGR
- BHR
- BHS
- BOL
- BRA
- BTN
- BWA
- CAN
- CHE
- CHL
- CHN
- CIV
- CMRCOG
- COL
- CRI
- CYP
- DEU
- DNK
- DOM
- DZA
- ECU
- EGY
- ESP
- EST
- FIN
- FJI
- FRA
- GAB
- GBR
- GHA
- GIN
- GMB
- GRC
- GRD
- HUN
- IDN
- IND
- IRL
- IRN
- ISL
- ISR
- ITA
- JAM
- JPN
- KEN
- KNA
- KOR
- KWT
- LBN
- LCA
- LUX
- MEX
- MDG
- MEX
- MUS
- MWI
- MWI
- MZN
- NAM
- NLD
- NOR
- NPL
- NZL
- OMN
- PAK
- PAN
- PER
- PHL
- PNG
- POL
- PRY
- ROM
- RUS
- RWI
- SDA
- SEN
- SGP
- SLE
- SLV
- SOM
- TCD
- THA
- TTO
- TUN
- TUR
- UGA
- UK
- UZB
- YEM
- ZAF
- ZMB
- ZWE

Daron Acemoglu (MIT)
Existing Evidence: State Centralization within Uganda

- Gennaioli and Rainer (2007):

Map 1  Distribution of centralized and fragmented ethnic groups across Uganda regions
Public Goods and State Centralization within Uganda

**Table 1** Precolonial centralization and public goods in Uganda

<table>
<thead>
<tr>
<th>Region</th>
<th>Precolonial institutions of ethnic groups</th>
<th>Central Centr</th>
<th>Western Centr</th>
<th>Eastern Mixed</th>
<th>Northern Fragm</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of roads paved in 2002</td>
<td>13.37</td>
<td>10.32</td>
<td>10.89</td>
<td>1.33</td>
<td></td>
</tr>
<tr>
<td>Infant mortality in 2001</td>
<td>71.9</td>
<td>97.8</td>
<td>89.3</td>
<td>105.9</td>
<td></td>
</tr>
<tr>
<td>% of children under five years with diarrhoea in 2001</td>
<td>14.5</td>
<td>16</td>
<td>23.3</td>
<td>26.7</td>
<td></td>
</tr>
<tr>
<td>Availability of sewerage system in 2000 (% of households)</td>
<td>15</td>
<td>14</td>
<td>9</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Piped water inside house in 2000 (% of households)</td>
<td>10</td>
<td>10</td>
<td>8</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Availability of latrine or human waste disposal service in 2000 (% of households)</td>
<td>96</td>
<td>86</td>
<td>77</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Adult literacy rate in 1997</td>
<td>72</td>
<td>61</td>
<td>54</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Adequacy of facility &amp; equipment at primary schools in 2000 (% of households satisfied)</td>
<td>62</td>
<td>72</td>
<td>55</td>
<td>51</td>
<td></td>
</tr>
</tbody>
</table>
But how is the state built? What is the *causal* impact of state capacity on development outcomes? Beyond the boundaries of the state? What about strategic interactions?
Local State Presence

- State capacity/presence is as much about local state presence.
- But in many countries there is endemic absence of the local and central state, such as Colombia.
- Rufino Gutierrez in 1912:

  “…in most municipalities there was no city council, mayor, district judge, tax collector… even less for road-building boards, nor whom to count on for the collection and distribution of rents, nor who may dare collect the property tax or any other contribution to the politically connected…”

- But then, local state presence doesn’t just have direct effects. Indirect effects (spillovers) may be as important:
  - public good provision, policing, and law enforcement will impact neighboring municipalities.
  - possibility of strategic interactions, free riding or complementarities in investments.
This suggests

- Game theoretic model to understand interactions among municipalities and between municipalities and the national state in state capacity choices.
- Estimate this model using data from Colombian municipalities to uncover:
  1. the **own effect** of state capacity on public goods and prosperity;
  2. the **spillover effects** of state capacity;
  3. the (strategic) **interaction effects** in state capacity choices (in particular, whether these are strategic complements or substitutes);
  4. the relationship between local and national state capacity choices.
Such an approach is to confront several key challenges:

1. State capacity choices are endogenous.
2. The estimation of spillovers ("contextual effects") is fraught with econometric difficulties because of reasons relate to both endogeneity and correlated effects.
3. The estimation of strategic interactions is even more difficult, taking us to the territory of Manski’s "endogenous effects".

Strategy: structurally estimate model parameters using exogenous (historical) sources of variation.
Model of State Capacity over a Network

- Network game of public goods provision
- Interpret the administrative municipality-level map as a network:
  - Each municipality is a node
  - Each adjacency implies a link (undirected).
- Municipalities (and the national level) choose their levels of state capacity simultaneously.
- Utility functions are “reduced form” for a political economy process where state capacity has both costs and benefits.
- The national state has heterogeneous preferences over outcomes of different municipalities (cares more about some).
Model: Network Structure

- Let us represent the network with matrix $N(\delta)$ with entries $n_{ij}$ where

\[
    n_{ij} = \begin{cases} 
    0 & \text{if } j \notin N(i) \\
    f_{ij} & \text{if } j \in N(i) 
    \end{cases}
\]

where

\[
    f_{ij} = \frac{1}{1 + \delta_1 d_{ij}(1 + \delta_2 e_{ij})}. 
\]

- $N(i)$ is the set of neighbors of $i$, $d_{ij}$ is geodesic distance between $i$ and $j$, $e_{ij}$ is variability in altitude along the geodesic.

- In our benchmark, a network link is given by adjacency between municipalities.
Model: Technology

- We allow different dimensions of prosperity $j = 1, \ldots, J$ to depend upon own and neighbors’ state capacity:

$$p^j_i = (\kappa_i + \zeta_i)s_i + \psi_1 s_i \mathbf{N}_i(\delta)s + \psi_2^j \mathbf{N}_i(\delta)s + e^j_i.$$ 

where $\mathbf{N}_i(\delta)$ denotes the $i$th row of the network matrix.

- $\kappa_i + \zeta_i$ is the effect of own state on own prosperity (heterogeneous, has observable and unobservable components);

- $\psi_1$ is the interaction effect (its sign determines whether this is a game of strategic complements or substitutes);

- $\psi_2^j$ is a pure spillover effect from neighbors;
Model: State Capacity

Let “state capacity” be a CES composite of locally chosen \( l_i \) and nationally decided \( b_i \) measures of state presence:

\[
s_i = \left[ \alpha \frac{l_i^{\sigma-1}}{\sigma} + (1 - \alpha) (\tau b_i)^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}} \quad \sigma > 0, \tau > 0.
\]

Simplest is the special case where \( \alpha = 0 \). But we can also study the general case where \( \alpha > 0 \) and national bureaucracy also matters and is endogenously determined.
Model: Preferences

Municipality $i$ maximizes

$$U_i = \mathbb{E}_e \left[ \frac{1}{J} \sum_{j} p_i^j - \frac{\theta}{2} l_i^2 \right].$$

The national state maximizes

$$W_i = \mathbb{E}_e \left[ \sum_{i} \left\{ U_i \zeta_i - \frac{\eta}{2} b_i^2 \right\} \right]$$

where the $\zeta_i$ are unobserved weights the national state puts on each $i$. 
Model: Game

- National and local-level state capacities are chosen simultaneously. This gives us straightforward first-order conditions.
- Municipality choices:
  \[
  \alpha \left[ \frac{s_i}{l_i} \right]^{\frac{1}{\sigma}} \left[ (\kappa_i + \xi_i) + \psi_1 N_i(\delta)s \right] - \theta l_i \begin{cases} 
  < 0 & l_i = 0 \\
  = 0 & l_i > 0 
\end{cases}
  \]

- A game of strategic complements or substitutes depending on \(\psi_1\):
  \[
  \frac{\partial l_i}{\partial N_i(\delta)s} > 0 \iff \psi_1 > 0
  \]

- We also derive the national state’s first-order conditions (not shown here):
  - The main difference is that the national state does take into account spillovers, and weights municipalities heterogeneously.
Model: Linear Special Case

- When $\alpha = 1$ the game described above simplifies considerably.
- National-level choices no longer relevant, and $s_i = l_i$.
- Best responses become linear in neighbors’ choices

$$s_i = \frac{\psi_1}{\theta} N_i(\delta)s + \frac{\kappa_i}{\theta} + \tilde{\xi}_i.$$  (1)

**Proposition (Bramoulle, Kranton, and D’Amours (2013))**: If $|\lambda_{min}(N(\delta))| < \left(\frac{\psi_1}{\theta}\right)^{-1}$ the game has a unique Nash equilibrium.

- Notice that the reduced-form coefficient $\frac{\psi_1}{\theta}$ is analogous to what Manski (1993) calls an “endogenous effect”
  - Thus empirical work here must deal with the “reflection problem”. Particularly serious since $\tilde{\xi}_i$’s likely to be spatially correlated.
- All of these results extend to the case where $\alpha < 1$. 
Substitute best responses into the prosperity equation

\[ p_j^i = \theta s_i^2 + \psi_j^i N_i(\delta)s + \epsilon_j^i. \]  

In equilibrium, the spillovers, \( \kappa_i \), and the interaction effect, \( \psi_1 \), drop out, and cannot be identified by running a regression of outcomes. This is because state capacity choices are (endogenously) a function of \( \kappa_i \) and \( \psi_1 \).

In addition, a quadratic relationship.

Another identification challenge: \( \epsilon_j^i \)'s also likely to be spatially correlated.
Model: Idea for Identification

- Parameter $\kappa_i$: a function of historical variables (described below) which are plausibly exogenous to the current development of state capacity and current prosperity.
  - Also, conveniently, they happen to be spatially uncorrelated.
- Using these variables and the network structure, estimate (1) and (2)—using linear IV, system GMM, maximum likelihood or simulated method of moments (SMM).
- From (1), we estimate $\frac{\psi_1}{\theta}$ (from the endogenous effect) and (local) average $\kappa_i$ (from the intercept).
- From estimate (2), we estimate $\theta$ and $\psi_2$, fully identifying all of the parameters.
- Note the importance of estimating the endogenous effect, from which the crucial identification of the outcome equation comes.
Empirical Strategy: Traditional Approaches

- This is a network identification problem.
- Common in the literature are two strategies. First, exploit the structure of the game (without correlated effects). E.g., Blume et al. (2013).
- Second, exploit network structure to break the “reflection problem”.
  - If for every node $i \exists k$ such that $k \in N(j)$, $j \in N(i)$, and $k \notin N(i)$, then covariate $x_k$ is a valid instrument.
  - Thus use powers of $N_i(\delta)x$ as instruments for $s_i$.
  - But problem: we may not know network structure exactly and more importantly, correlated effects that extend beyond immediate neighborhood.
Empirical Strategy: Exclusion Restrictions

- Better identification strategy would be to exploit exogenous sources of variation both for own and spillover effects.
- Idea: use historical variables affecting the development of the state: colonial stage presence and royal roads, denoted by vector $c$.
- Formally:
  \[
  \text{cov}(N_i(\delta)c, \tilde{\xi}_i) = \text{cov}(N_i^2(\delta)c, \tilde{\xi}_i) = 0
  \]
  and
  \[
  \text{cov}(c, \epsilon^j_i) = \text{cov}(N_i(\delta)c, \epsilon^j_i) = \text{cov}(N_i^2(\delta)c, \epsilon^j_i) = 0.
  \]
- Why is this plausible?
Colonial State Presence

- Highly concentrated colonial state presence around key cities and resources:
  - Colonial state presence in gold mining regions related to taxation purposes.
  - Colonial state presence in high native population regions related to control of the population, legal adjudication, etc.
  - Colonial state presence in geographically strategic places related to military aims.

- Gold mining, native populations and those military aims are no longer relevant. So the direct effect of colonial state presence is by creating the infrastructure for current state presence.
Royal Roads

- Royal roads were one of the few investments in infrastructure (building upon pre-colonial roads).
- The presence of royal roads is a good indicator of where the colonial state was interested in reaching out, and controlling territory.
- But most of these royal roads were subsequently abandoned as transportation infrastructure.
  - Most of these were built for porterage along difficult geography, making them hard to subsequently reconvert to new transportation technologies.
- Good case that these are excludable (especially conditional on current road network).
Correlated Effects

- If these instruments are spatially correlated, then the spatial correlation of current outcomes might project on them, leading to bias.
- Interestingly, very little spatial correlation of the colonial state presence or royal roads data.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Own distance to royal roads</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Neighbors' average distance to royal roads</td>
<td>0.283</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Neighbors of neighbors' distance to royal roads</td>
<td>0.045</td>
<td>0.615</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Own colonial officials</td>
<td></td>
<td>-0.095</td>
<td>-0.072</td>
<td>-0.047</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Neighbors' average colonial officials</td>
<td></td>
<td>-0.146</td>
<td>0.039</td>
<td>0.060</td>
<td>-0.061</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Neighbors of neighbors' colonial officials</td>
<td></td>
<td>-0.044</td>
<td>0.063</td>
<td>0.072</td>
<td>-0.062</td>
<td>-0.070</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Own colonial state agencies</td>
<td></td>
<td></td>
<td>-0.135</td>
<td>-0.039</td>
<td>-0.017</td>
<td>0.545</td>
<td>0.006</td>
<td>-0.002</td>
<td>1.000</td>
</tr>
<tr>
<td>8. Neighbors' average colonial state agencies</td>
<td></td>
<td></td>
<td>-0.208</td>
<td>0.250</td>
<td>0.283</td>
<td>-0.053</td>
<td>0.490</td>
<td>0.008</td>
<td>0.022</td>
</tr>
<tr>
<td>9. Neighbors of neighbors' colonial state agencies</td>
<td></td>
<td></td>
<td></td>
<td>-0.193</td>
<td>0.244</td>
<td>0.334</td>
<td>-0.036</td>
<td>0.031</td>
<td>0.408</td>
</tr>
</tbody>
</table>

Correlations reported are the average across-departments of the correlations for each department.
Empirical Strategy: Linear Model

- Now focus on $\alpha = 1$ (linear best responses and prosperity equations).
- Suppose that $\frac{\kappa_i}{\theta} = g(c_i \varphi + x_i \beta) + \zeta^D$, where $\zeta^D$ are department fixed effects.
- Then we have

$$s_i = \frac{\psi_1}{\theta} N_i(\delta) s + g(c_i \varphi + x_i \beta) + \zeta^D + \tilde{\zeta}_i.$$  

$$p_i^j = \theta s_i^2 + \psi_2^j N_i(\delta) s + x_i \tilde{\beta}^j + \zeta^D + \epsilon_i^j.$$

- Two econometric strategies
  - Linear IV (normalizing $\delta = (1, 1)$) estimate these equations separately.
  - System GMM ($J + 1$ equations) that exploits the joint dependence on $\theta$, and allows for estimation of $\delta$. 
### Table 3. Contemporary State Equilibrium Best Response

<table>
<thead>
<tr>
<th>State capacity measured as log of:</th>
<th>Number of state agencies</th>
<th>Number of municipality employees</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) OLS</td>
<td>(2) IV</td>
<td>(3) IV</td>
</tr>
<tr>
<td></td>
<td>(5) OLS</td>
<td>(6) IV</td>
<td>(7) IV</td>
</tr>
<tr>
<td>dsi/ds_j</td>
<td>0.016</td>
<td>0.017</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.003)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>dsi/dcolonial state officials</td>
<td>0.127</td>
<td>0.128</td>
<td>0.108</td>
</tr>
<tr>
<td></td>
<td>(0.031)</td>
<td>(0.031)</td>
<td>(0.033)</td>
</tr>
<tr>
<td>dsi/dcolonial state agencies</td>
<td>0.003</td>
<td>0.001</td>
<td>-0.016</td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
<td>(0.033)</td>
<td>(0.033)</td>
</tr>
<tr>
<td>dsi/ddistance to royal road</td>
<td>0.008</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.021)</td>
</tr>
</tbody>
</table>
Interpretation

- Best response slopes upward (investments in state capacity are strategic complements).
- Own colonial state officials significantly increase own state capacity today.
- Conditional on this, colonial state agencies and distance to royal roads insignificant, but significant with the right sign when colonial state officials are excluded.
### Estimates of the Prosperity Equation

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Not in poverty</th>
<th>Secondary enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(9)</td>
<td>(10)</td>
</tr>
<tr>
<td></td>
<td>OLS</td>
<td>IV</td>
</tr>
<tr>
<td>dpi/dsi</td>
<td>0.520</td>
<td>0.342</td>
</tr>
<tr>
<td></td>
<td>(0.038)</td>
<td>(0.141)</td>
</tr>
<tr>
<td>dpi/dsj</td>
<td>0.019</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.006)</td>
</tr>
</tbody>
</table>

#### Panel II

| F-test for excluded instruments: | 31.01 | 35.06 | 30.46 | 35.70 |
| F-test p-value                  | 0.000 | 0.000 | 0.000 | 0.000 |
| First-stage R-squared           | 0.670 | 0.655 | 0.675 | 0.662 |

First-stage linear model:

| F-test for excluded instruments: | 524.6 | 522.1 | 579.3 | 583.1 |
| F-test p-value                  | 0.000 | 0.000 | 0.000 | 0.000 |
| First-stage R-squared           | 0.769 | 0.770 | 0.771 | 0.773 |

<table>
<thead>
<tr>
<th>Log population</th>
<th>Control</th>
<th>Control</th>
<th>Instrument</th>
<th>Instrument</th>
<th>Control</th>
<th>Control</th>
<th>Instrument</th>
<th>Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>975</td>
<td>975</td>
<td>963</td>
<td>963</td>
<td>965</td>
<td>965</td>
<td>965</td>
<td>963</td>
</tr>
</tbody>
</table>
Interpretation and Magnitudes

- Own effect more than 15 times the impact on neighbors, which is plausible.
- But the external it is on several neighbors, so the partial equilibrium spillover and direct effects comparable.
- But full equilibrium effects, factoring in endogenous responses, indicate much larger network effects than direct effect.
### Table 5. Experiment: Implications of Moving All Municipalities below Median State Capacity to Median

<table>
<thead>
<tr>
<th>Panel Ia</th>
<th>Linear model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial equilibrium change in:</td>
<td></td>
</tr>
<tr>
<td>Change in median:</td>
<td></td>
</tr>
<tr>
<td>From 10 To 10</td>
<td>From 48.0 To 49.0</td>
</tr>
<tr>
<td>Utilities coverage</td>
<td></td>
</tr>
<tr>
<td>From 53.3 To 57.2</td>
<td></td>
</tr>
<tr>
<td>% not in poverty</td>
<td></td>
</tr>
<tr>
<td>From 57.1 To 60.0</td>
<td></td>
</tr>
<tr>
<td>Secondary enroll.</td>
<td></td>
</tr>
<tr>
<td>From 56.6 To 59.2</td>
<td></td>
</tr>
<tr>
<td>Fraction due to own effect:</td>
<td></td>
</tr>
<tr>
<td>53.4%</td>
<td></td>
</tr>
<tr>
<td>Fraction due to spillovers:</td>
<td></td>
</tr>
<tr>
<td>46.6%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel Ia</th>
<th>Linear model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial equilibrium change in:</td>
<td></td>
</tr>
<tr>
<td>Change in median:</td>
<td></td>
</tr>
<tr>
<td>From 10 To 20.6</td>
<td>From 48.0 To 58.2</td>
</tr>
<tr>
<td>Utilities coverage</td>
<td></td>
</tr>
<tr>
<td>From 53.3 To 73.7</td>
<td></td>
</tr>
<tr>
<td>% not in poverty</td>
<td></td>
</tr>
<tr>
<td>From 57.1 To 68.3</td>
<td></td>
</tr>
<tr>
<td>Secondary enroll.</td>
<td></td>
</tr>
<tr>
<td>From 56.6 To 82.4</td>
<td></td>
</tr>
<tr>
<td>Fraction due to direct effect:</td>
<td></td>
</tr>
<tr>
<td>9.8%</td>
<td></td>
</tr>
<tr>
<td>Fraction due to network effects:</td>
<td></td>
</tr>
<tr>
<td>90.2%</td>
<td></td>
</tr>
</tbody>
</table>
This implies that increasing local state presence in all municipalities below the median to the median of the country, holding all other state capacity choices fixed, reduces fraction of the population about poverty from 57% to 60%.

About 57% of this increase is due to direct effects, and the remaining 43% to spillovers.

But once, there is this induced change in state capacities, there will be further network responses—through strategic complementarities.

Once these are factored in, fraction of the population above poverty rises to 68%— of course all of this due to network effects.
Robustness

- Very similar results with System GMM.
- The \( g(\cdot) \) function is indeed nonlinear, but implied quantitative magnitudes are essentially the same.
- Similar results with additional controls and to different strategies, including various controls for the effects of national bureaucracy.
- Similar results when national state’s decisions are endogenized, modeled and estimated.
Implications for Political and Social Change

- State capacity very important for public good provision and economic development.
- But unlikely to be sufficiently built from the bottom up because of spillovers and network effects.
- Importance of “state centralization”.
African Chiefs

- In a predominantly rural continent, where the central state lacks capacity, chiefs are charged with the day-to-day running of the state.
- They allocate land, control judicial decisions, taxes, expenditure on public goods, and even the allocation of labor (through coercion).
Two views about chiefs

1. Chiefs as Despots
   - Chiefs are unaccountable local despots, contributing to rural economic underdevelopment (e.g., Mamdani, 1996).
   - Colonial policies of indirect rule warped indigenous political institutions by removing key elements of accountability, a situation which perpetuated itself after independence.
   - In Sierra Leone, predatory behavior by the chiefs is deemed so severe that it is argued to have been a major cause of the civil war that erupted in 1991 (e.g., Richards, 1996).

2. Chiefs as Representatives
   - Chiefs are legitimate and responsive to local demands and needs. In the AFRObarometer surveys, 61% of respondents report considerable trust in traditional leaders, whereas only 51% report such trust in local government officials.
In Sierra Leone, British colonialism transformed society in 1896 by empowering a set of paramount chiefs as the sole authority of local government in the newly created Sierra Leone Protectorate.

The paramount chiefs and the chiefs under them remained effectively the only institution of local government until the World Bank sponsored creation of a system of local councils in 2004.

These paramount chiefs are elected for life by a Tribal Authority made up of local notables.

Only individuals from the designated “ruling families” of a chieftaincy, the aristocracy created and given exclusive right to rule by the British at the initiation of the system in 1896, are eligible to become paramount chiefs.
The Ruling Families

- The number of ruling families is a natural constraint on the ability of the paramount chief to exploit the power of the chieftaincy.
- The Tribal Authority is analogous to an electoral college. An increased number of families will mean there are more interest groups within the college one must appease to be elected; satisfying a greater plurality of interests should be more difficult when there are more families, and so it should be more difficult to concentrate power in one family. Even if one family is able to dominate the chieftaincy for many generations, an increased number of families implies a greater potential for the family to lose the paramount chieftaincy in an election.
- This creates an important (though often off-equilibrium path) threat that will discipline paramount chiefs, forcing them to govern better.

**Data collection**: Collected extensive data on ruling families from all chieftaincies in Sierra Leone.
Impact of the Number of Ruling Families on Development

- There is a significant positive relationship between the number of families and:
  1. Human capital outcomes, such as literacy and educational attainment
  2. Child health outcomes
  3. The proportion of people working outside of agriculture (which is a useful proxy for the economic development in view of the fact that there is no micro data on incomes in Sierra Leone)
  4. Different measures of asset wealth (mobile phone ownership and concrete floors in home)

- Quantitatively, the effects are substantial: Moving from 2 ruling families to 8 (i.e., from the bottom quartile to the top) would increase secondary school attainment by 5 percentage points (primary school attainment or literacy increases by 7 percentage points), and increases non-agricultural employment by 3 percentage points, from a base of only 7 percent.

- These results are in line with the “chiefs as despots” view.
### Ruling Families and Education

**TABLE 4**
**EDUCATIONAL OUTCOMES, RESULTS**

<table>
<thead>
<tr>
<th></th>
<th>Literacy</th>
<th>Primary School Attainment</th>
<th>Secondary School Attainment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Census (1)</td>
<td>Census (2)</td>
<td>Census (3)</td>
</tr>
<tr>
<td>ln(number of ruling families)</td>
<td>.051 (.013)</td>
<td>.046 (.011)</td>
<td>.047 (.024)</td>
</tr>
<tr>
<td>Number of ruling families</td>
<td>- .000 (.006)</td>
<td>- .000 (.006)</td>
<td>- .000 (.006)</td>
</tr>
<tr>
<td>Amalgamation</td>
<td>-.038 (.021)</td>
<td>-.033 (.018)</td>
<td>-.032 (.018)</td>
</tr>
<tr>
<td>Number of chiefs recalled</td>
<td>.000 (.003)</td>
<td>.000 (.002)</td>
<td>.000 (.002)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.008</td>
<td>.131</td>
<td>.131</td>
</tr>
</tbody>
</table>

---

**Daron Acemoglu (MIT)**
### TABLE 6
Economic Outcomes, Results

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Nonagricultural Employment Census (1)</th>
<th>Asset Wealth Index DHS (2)</th>
<th>Asset Wealth Index NPS (3)</th>
<th>Housing Quality Index NPS (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Baseline Specification</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ln(number of ruling families)</td>
<td>.016 (.008)</td>
<td>.260 (.136)</td>
<td>.028 (.010)</td>
<td>.058 (.023)</td>
</tr>
<tr>
<td>$\chi^2$ test p-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.051</td>
<td>.057</td>
<td>.063</td>
<td>.094</td>
</tr>
</tbody>
</table>

Ruling Families and Economic Outcomes
However, places with fewer ruling families have more favorable attitudes towards the paramount chief’s authority!

In addition, many measures of social capital, such as attendance of community meetings, participation in social groups and the undertaking of collective actions, are also higher in places with fewer families.

These results are in line with the “chiefs as representatives” view.
## Ruling Families and Attitudes

<table>
<thead>
<tr>
<th></th>
<th>Agree One Should Respect Authority</th>
<th>Agree Only Older People Can Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>ln(number of ruling families)</td>
<td>-0.085 (0.028)</td>
<td>-0.084 (0.028)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.047</td>
<td>0.052</td>
</tr>
<tr>
<td></td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>ln(number of ruling families)</td>
<td>-0.054 (0.022)</td>
<td>-0.059 (0.022)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.081</td>
<td>0.048</td>
</tr>
</tbody>
</table>
Reconciling the Views

- Institutions in many weakly institutionalized polities are not designed to control politicians but are structured by them to further their power and their own control of society.
- Paramount chiefs facing limited competition do indeed act despastically, but they are able to do so in part because they use non-governmental organizations as a way of building and mobilizing support.
- Put differently, bridging social capital in villages with powerful paramount chiefs is not a sign of a vibrant civil society disciplining politicians, but of a dysfunctional civil society captured by the paramount chiefs.
- If civil society has been completely captured, citizens will still find it valuable to interact with the government. In places where paramount chiefs are powerful, people will be more dependent on their patronage and favors, and thus will find it useful to make specific investments in the system.
Political and social change—in this instance to reduce the despotic power of African chiefs—needs to go hand-in-hand. But the typical approach, for example as developed by the World Bank, which involves working with existing networks of civil society and civic activity in villages may be inadequate. Instead, effective political change may require a significant break with existing social institutions as well.
The removal of political rent-seeking and the networks that facilitate it is one of the most challenging parts of effective institutional reform. But how can this be done? One possibility is that the *de facto* power emanating from street protests or threat of popular uprisings can constrain and ultimately reign in such rent seeking.

Historically, there are several examples of such *de facto* power constraining and ultimately changing the distribution of *de jure* power; e.g., the rise of Western democracy (Acemoglu and Robinson, 2000, 2006).

But many other instances in which popular pressures are defused by illusory changes or real changes that are later equally corrupted (Michels, 1966, Acemoglu and Robinson, 2008).

A particularly informative case study: Egypt’s Arab Spring.
Questions

Use event-studies in the Egyptian stock market to address three questions:

1. Did the regime changes induced by Egyptian popular uprisings also uproot the rent-seeking network that supported the incumbent regime?

2. If so, can street protests prevent the re-mergence of a new rent-seeking coalition centering on the Muslim Brotherhood or the Egyptian Military?

3. Absent a change in government, can street protests constrain or re-distribute political rents?
Summary of Results

1. Many firms on the Egyptian stock market were politically connected to Mubarak’s regime, either through the National Democratic Party (NDP) or through members of the military.

2. The popular uprising that precipitated Mubarak’s fall reduced the market value of firms connected via the NDP by 16.7% or $4.19bn, while it had no significant effect on the value of firms connected through the military. Mohammed Mursi’s accession to power on June 24, 2012 increased the market value of firms operating according to Islamic principles.

3. The turnout of additional protesters in Tahrir square significantly reduced the stock market valuation of firms connected to the incumbent government (first the NDP, then the Military).

   → Findings are consistent with the view that street protests effective in influencing rent seeking, even absent government change.

   → But these effects highly volatile, reflecting the volatile, ephemeral nature of protests.
## Illustrative Results

### Table 4: Feb 11, 2011: Mubarak’s Fall - Alternative Event Windows

<table>
<thead>
<tr>
<th></th>
<th>CR[0,59]</th>
<th>CR[0,62]</th>
<th>CR[0,63]</th>
<th>CR[0,64]</th>
<th>CR[0,65]</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDP</td>
<td>-0.093**</td>
<td>-0.102*</td>
<td>-0.106*</td>
<td>-0.124**</td>
<td>-0.134**</td>
</tr>
<tr>
<td></td>
<td>(0.042)</td>
<td>(0.059)</td>
<td>(0.056)</td>
<td>(0.060)</td>
<td>(0.064)</td>
</tr>
<tr>
<td>Military</td>
<td>0.036</td>
<td>0.075</td>
<td>0.059</td>
<td>0.073*</td>
<td>0.080*</td>
</tr>
<tr>
<td></td>
<td>(0.046)</td>
<td>(0.050)</td>
<td>(0.042)</td>
<td>(0.038)</td>
<td>(0.040)</td>
</tr>
<tr>
<td>Islamic</td>
<td>-0.106</td>
<td>-0.082</td>
<td>-0.083</td>
<td>-0.092</td>
<td>-0.089</td>
</tr>
<tr>
<td></td>
<td>(0.075)</td>
<td>(0.076)</td>
<td>(0.065)</td>
<td>(0.065)</td>
<td>(0.067)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.011</td>
<td>0.023</td>
<td>0.046</td>
<td>0.079</td>
<td>0.087</td>
</tr>
<tr>
<td>N</td>
<td>137</td>
<td>147</td>
<td>147</td>
<td>147</td>
<td>143</td>
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<tr>
<td>Sector F.E.</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Std. Controls</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>
Estimating the Effects of Street Protests

Number of Protesters in Tahrir Square

- Median Number of Protesters in thousands
- Date from 01jan2011 to 01jul2013

Key Events:
- NDP Dissolved
- Military Crackdown
- Presidential Elections
- Morsi coup
- Constitution Passes
- Morsi Toppled

Periods:
- Mubarak Falls
- Military Rule
- Islamic Rule
Estimating the Effects of Street Protests

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mubarak’s Fall</td>
<td>1st Military Rule</td>
<td>Islamist Rule</td>
<td>2nd Military Rule</td>
</tr>
<tr>
<td>NDP x Protesters</td>
<td>-0.004*</td>
<td>-0.011</td>
<td>0.027</td>
<td>-0.062</td>
</tr>
<tr>
<td>(0.002)</td>
<td>(0.038)</td>
<td>(0.025)</td>
<td>(0.148)</td>
<td></td>
</tr>
<tr>
<td>Military x Protesters</td>
<td>-0.003</td>
<td>-0.059**</td>
<td>-0.021</td>
<td>-0.029</td>
</tr>
<tr>
<td>(0.002)</td>
<td>(0.028)</td>
<td>(0.021)</td>
<td>(0.123)</td>
<td></td>
</tr>
<tr>
<td>Islamic x Protesters</td>
<td>0.005</td>
<td>0.060*</td>
<td>0.039</td>
<td>-0.267*</td>
</tr>
<tr>
<td>(0.004)</td>
<td>(0.035)</td>
<td>(0.029)</td>
<td>(0.162)</td>
<td></td>
</tr>
<tr>
<td>NDP</td>
<td>-0.009**</td>
<td>-0.000</td>
<td>0.000</td>
<td>0.002</td>
</tr>
<tr>
<td>(0.002)</td>
<td>(0.000)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td></td>
</tr>
<tr>
<td>Military</td>
<td>0.001</td>
<td>0.000</td>
<td>-0.000</td>
<td>0.001</td>
</tr>
<tr>
<td>(0.002)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.002)</td>
<td></td>
</tr>
<tr>
<td>Islamic</td>
<td>-0.007**</td>
<td>0.000</td>
<td>-0.001</td>
<td>-0.001</td>
</tr>
<tr>
<td>(0.003)</td>
<td>(0.000)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td></td>
</tr>
<tr>
<td>NDP x Pro-MB Protesters</td>
<td></td>
<td></td>
<td></td>
<td>-1.602</td>
</tr>
<tr>
<td>(2.310)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Military x Pro-MB Protesters</td>
<td></td>
<td></td>
<td></td>
<td>-1.292</td>
</tr>
<tr>
<td>(1.899)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islamic x Pro-MB Protesters</td>
<td></td>
<td></td>
<td></td>
<td>5.649**</td>
</tr>
<tr>
<td>(2.565)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.655</td>
<td>0.331</td>
<td>0.356</td>
<td>0.426</td>
</tr>
<tr>
<td>N</td>
<td>3059</td>
<td>43997</td>
<td>27343</td>
<td>1895</td>
</tr>
<tr>
<td>Total # Protesters (10m)</td>
<td>3.19</td>
<td>0.47</td>
<td>0.52</td>
<td>0.05</td>
</tr>
</tbody>
</table>
Ongoing Work

- Used twitter data in order to develop better measures of mobilization.
- General issues: using social media information for measuring social and political mobilization.
### Table 21: Correlation between Protesters and Retweets and Hashtags2

<table>
<thead>
<tr>
<th></th>
<th>Number of Protesters in Tahrir Square (Thousands)</th>
<th>Two phases combined</th>
<th>Mubarak Falls</th>
<th>Military Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>All days</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retweets of the Opposition’s Tweets</td>
<td>-0.0298</td>
<td>-0.1274</td>
<td>0.0686</td>
<td></td>
</tr>
<tr>
<td>1-day lagged Retweets of the Opposition’s Tweets</td>
<td>-0.0233</td>
<td>-0.0782</td>
<td>0.0763*</td>
<td></td>
</tr>
<tr>
<td>Number of Tahrir Square Hashtags2</td>
<td>0.0979**</td>
<td>0.3008***</td>
<td>0.1981***</td>
<td></td>
</tr>
<tr>
<td>1-day lagged Number of Tahrir Square Hashtags2</td>
<td>0.1149***</td>
<td>0.2182**</td>
<td>0.2419***</td>
<td></td>
</tr>
<tr>
<td>Protest days only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retweets of the Opposition’s Tweets</td>
<td>-0.1640</td>
<td>-0.1398</td>
<td>-0.0851</td>
<td></td>
</tr>
<tr>
<td>1-day lagged Retweets of the Opposition’s Tweets</td>
<td>-0.1180</td>
<td>0.0195</td>
<td>-0.0153</td>
<td></td>
</tr>
<tr>
<td>Number of Tahrir Square Hashtags2</td>
<td>-0.0778</td>
<td>0.1479</td>
<td>-0.0073</td>
<td></td>
</tr>
<tr>
<td>1-day lagged Number of Tahrir Square Hashtags2</td>
<td>-0.0089</td>
<td>0.1142</td>
<td>0.1066</td>
<td></td>
</tr>
</tbody>
</table>
Implications for Political and Social Change

- *De facto* political power coming from street protests and uprisings can be an important factor on rent seeking networks in societies with weak institutions.

- But it is, by its nature, transitory, so unlikely to be a sufficient basis for a constraint on these networks.

- Instead, it leads to temporary disruption of these networks and can trigger changes in their nature, but their long-term elimination or containment requires more systematic institutional changes.